COMMENTARY

A new relationship

Fuelling innovation requires a different kind of collaboration between industrial and academic researchers, argues **Bill Destler**.

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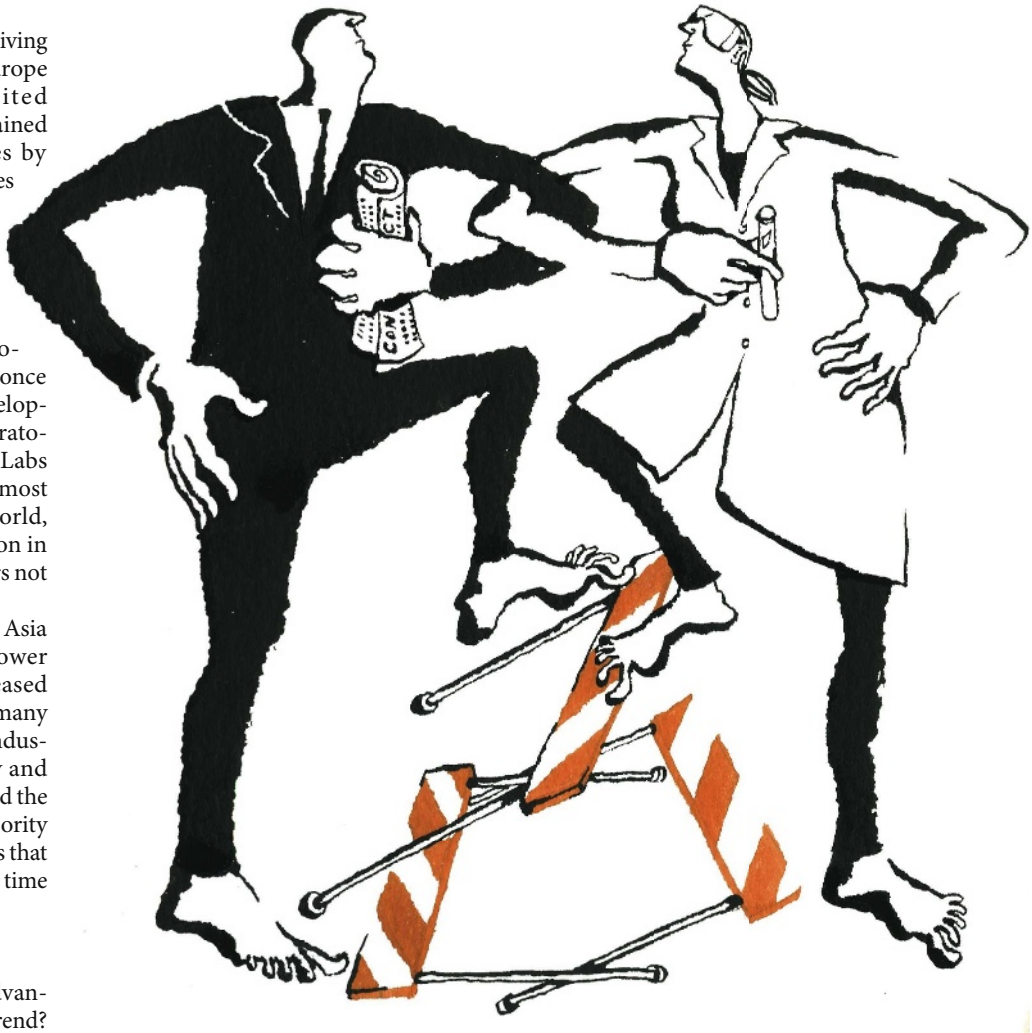
The standard of living in Western Europe and the United States has been sustained for several decades by new products, services and businesses, the result of leading-edge research and development (R&D). Nevertheless, competitive cost cutting has forced the elimination of all but the shortest-term private-sector R&D programmes. Major corporate laboratories, once remarkable catalysts for economic development, have all but vanished. RCA Laboratories, for example, no longer exists. Bell Labs in Murray Hill, New Jersey, once the foremost corporate research laboratory in the world, saw its budget reduced from US$3 billion in 1982 to $1.3 billion in 2005 (actual dollars not adjusted for inflation).

Meanwhile, corporate competitors in Asia and elsewhere, taking advantage of lower labour costs in many cases, have increased their R&D efforts to the point at which many are now superior to companies in the industrialized West in both product quality and productivity[1]. As a result, both Europe and the United States may soon find that the majority of the new ideas for products and services that result in economic growth are, for the first time in modern history, generated elsewhere.



B. MELLOR

Competitive advantage

Does the West have any competitive advantages that it could exploit to correct this trend? Well, the institutions of higher education in the United States and in Western Europe are still regarded as the finest in the world. The 2007 World University Rankings[2] by Shanghai Jiao Tong University in China, for example, list 48 North American and European institutions in the top 50, and together they possess an unmatched reservoir of intellectual talent and creativity. Graduate students, moreover, are still the most cost-effective R&D labour force anywhere, and with most faculty member salaries typically paid by colleges and universities for instructional services, the costs of adding this intellectual firepower to R&D projects is minimal. In addition, many colleges and universities have laboratory assets that would be prohibitively expensive for most companies to reproduce.

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Academic obstacles

So why haven't US and European corporations adopted colleges and universities as their corporate R&D centres? Why aren't more technology-based companies incubating their new product concepts at universities? Both parties are to blame. On the academic side, a number of factors work against the best interests of all involved.

First there is the 'Gatorade' factor: a small number of colleges and universities, mostly in the United States, have reaped financial windfalls from intellectual property developed by their faculty members. The University of Florida, for example, has received more than $150 million in royalties for licensing its Gatorade drink formula since creating it in 1965. This dream of significant financial return has led colleges and universities to demand intellectual-property rights and subsequent royalty payments from the corporate sector with such vigour that many collaborative projects are terminated by lawyers before they even begin. University faculty members and administrators typically have no idea of what it takes to move an idea to the point at which it can be turned into a new product or service for which there is commercial demand, and this naivety can make negotiations with academia over intellectual-property and

royalty issues an exercise in frustration.

Then there's the 'give us the money and we'll work on something related to your interest' factor: faculty members are usually looking for support for their own ideas, not those of others, and that causes many corporate executives to wonder what it is they are funding.

Finally there's the 'fund me for three years and I'll give you a progress report' factor: academic timescales are typically much longer than corporations can tolerate, especially when they are under competitive pressure from abroad. Companies are not in business to fund PhD dissertations. They have specific questions that need answers and they need them on a timescale of a year or less.

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Corporate clogging

On the corporate side, there are also negative factors at work.

One of those is the 'next quarter's bottom line' factor: the increased expectations of corporate boards and shareholders for short-term profit growth has made it difficult for managers to justify significant investments in medium- and long-term R&D projects. It is amazing that people still question Toyota's multi-year, billion-dollar commitment to hybrid-vehicle development, a commitment US and European car companies were unwilling to make because of the long lead-time that was necessary before any profits could be realized. This was a technology, by the way, that was pioneered in the United States.

There is also the 'we'll buy any new technology we need' factor: corporate acquisitions and mergers are consuming untold dollars and euros in legal costs without adding any really new intellectual assets to US and Western European inventories. These funds could be better used to fund technology R&D to help maintain a position of technological leadership.

Additionally, there is the 'we won't pay overheads' factor: many companies refuse to acknowledge the very real costs that universities must bear to support R&D projects. They often baulk at paying overhead rates at academic institutions that are typically 50% or less of direct cost (such as salaries to researchers, materials and equipment), despite the fact that many companies have internal overhead rates of more than 100% of direct cost on internal corporate R&D projects.

Brave new world

There is a potential solution. Imagine, if you will, a group of colleges and universities that decide to make their faculty members and staff, graduate and undergraduate students, and facilities available to companies to carry out short- and medium-term corporate R&D projects at low cost and without the intellectual-property fights that usually derail such efforts. Imagine a new relationship between business and academia in which hundreds of companies discover that they can once again afford to do new product R&D, while identifying future employees at the same time.

Imagine if companies were able to submit candidate short-term (about 1 year) R&D projects to a central receiving point where they could be matched up with qualified faculty members and students at participating colleges and universities. Graduate students, under the supervision of a faculty member and a corporate representative, might be assigned to work on each project as a thesis problem. Faculty members and students who sign up for such projects would therefore have a real interest in the problem, and the ongoing interaction between the faculty members, students and corporate representatives would be of benefit to all three groups. Suppose, in addition, that the participating colleges and universities agree to accept a modest up-front payment, to be shared by the students, faculty and the institution, in return for relinquishing any intellectual-property rights associated with the work to the sponsoring company.

Such an arrangement could re-energize corporate R&D, but only if business and academia join together to craft template agreements in which all parties see real benefits to their organizations as a result of the collaboration. At the Rochester Institute of Technology (RIT) in New York, we are working with several corporate representatives, and have developed such an agreement in which the university receives a flat fee for a year-long project. The fee includes the costs of faculty-member and student time, access to university facilities, university overheads, and a modest payment in lieu of any future university intellectual-property claims associated with the work. Funding for supplies and equipment not already in hand is added to the flat fee. Proposed projects come from either corporations or university faculty members, and projects are accepted when a match between the company's research needs and university capabilities is evident. Participation by all parties (companies, universities, faculty members and students) is voluntary, and the university reserves the right to publish the results of the research after an appropriate delay (usually not to exceed one year) to enable the company to pursue intellectual-property protection.

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Such a programme assumes that the university does not already own significant intellectual property in the area of the participating company's interests. If previous work by university faculty members and students has resulted in university-owned patents or copyrighted work prior to the agreement with the corporation, a more traditional licensing agreement could cover that part of the work and any new intellectual property generated could be covered by the template agreement. The agreement could be readily adapted to different circumstances.

Since the RIT programme was announced in March 2008, three companies have already signed on to fund projects at the institute under the template agreement, with one (PAETEC, a telecommunications firm based in Rochester) committing to a total funding level of approximately $1 million over the next three years. Discussions with seven additional companies are currently under way.

Clearly, such arrangements would benefit both industry and academia. Although it is not a good thing in general to have the private sector dictate the intellectual directions that colleges and universities take, much university research today is of a very basic nature and there are benefits to connecting more of this activity with real-world needs. If universities and colleges are to become the economic engines in their communities that they aspire to be, then their R&D activities need to be focused both on traditional long-term fundamental research that advances human understanding and on shorter-term projects that have the potential to lead to new products and services.

The West must get on with it. Its future economic prosperity may well depend on its success in exploiting one of its last competitive advantages — the institutions of higher education and the extraordinary research and development assets that they represent. ■

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1. Okimoto, D. I. & Nishi, Y. in *The Japanese Firm: Sources of Competitive Strength* (eds Aoki, M & Dore, R.) 178–207 (Clarendon, Oxford & New York, 1994).
2. http://ed.sjtu.edu.cn/rank/2007/ARWU2007_Top100.htm

For more details and to see the template agreement used in negotiation of these projects, visit http://www.rit.edu/research/srs/formsagreements/#agreements.

See Editorial, page 823 and online at http://tinyurl.com/3tt3y3.